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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/309,894	05/11/1999	HIROAKI TAKEBE	826.1546/JDH	8094

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STAAS & HALSEY LLP
700 11TH STREET, NW
SUITE 500
WASHINGTON, DC 20001

EXAMINER

DASTOURI, MEHRDAD

ART UNIT

PAPER NUMBER

2623

DATE MAILED: 11/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/309,894

Applicant(s)

TAKEBE ET AL.

Examiner

Mehrdad Dastouri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20218
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

Response to Amendment

1. Applicants' amendment filed, September 5, 2002, has been entered and made of record.
2. Applicants' arguments with respect to Claim 1, 9-13 have been fully considered but they are not persuasive.

Regarding Claims 1 and 9-13, Applicants argue in essence that prior art of record Lyon does not disclose the recognition target is not required to be divided in units of characters even if the recognition target comprises a plurality of characters. The Examiner disagrees and indicates that as depicted in Figures 14-16, Lyon's invention disclose recognition of a target that is not required to be divided in units of characters even if the recognition target comprises a plurality of characters (Figures 14-16; Column 20, Lines 34-62. Word recognition unit 22 generates a feature amount (Figure 3; word structure 60) for only a candidate word shown in Figure 14 (word or ideograph 300). During recognition process, the recognition target which is not divided in units of characters will be recognized (e.g., Radical 300, the first ideograph shown in Figure 15, which is a word meaning "wood" and is not divided in units of characters will be recognized.).

3. Regarding Claim 3, Applicants argue in essence that prior art of record Tsuruoka et al does not disclose taking a one-dimensional gradating conversion and involves the use of a two-dimensional Gaussian filter. The examiner disagrees and indicates that as depicted in Figures 2 and 3(a), and described in Section 2.1, "Weighted Direction Index Histogram Method" and Section 2.2, "3-Dimensional interpretation". The gradation conversion is performed in a direction perpendicular to the connecting direction of the characters (i.e., the weighted direction

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index histogram is generated in the third axis or "g" direction.). Gaussian filters are separable filters. Tsuruoka et al teachings are applicable to both directions and encompasses one-dimensional gradating conversion in a direction perpendicular to a connecting direction of characters for a direction code histogram of a contour line.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5, 7, 8-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Lyon (U.S. 5,675,665).

Regarding Claim 1, Lyon discloses a word recognizing apparatus, comprising:

a listing unit for storing a list of at least one candidate word (Figure 1, lexicon memory 30, word memory 32; Column 4, Lines 63-67);

a dictionary unit storing feature amounts of a plurality of characters (Figures 1 and 5-7, bounds measurement memory 36, bounds model memory 38; Column 10, Lines 39-67, Column 11, Lines 1-25. Based on the feature amounts extracted from the training word characters, feature amounts of plurality of model characters are extracted and stored in bounds model memory 38 as depicted in Figures 6 and 7.);

an extracting unit extracting a feature amount from a recognition target by a process in which the recognition target is not required to be divided in units of characters even if the

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recognition target comprises a plurality of characters (Figures 14-16; Column 20, Lines 34-62. Word recognition unit 22 generates a feature amount (Figure 3; word structure 60) for only a candidate word shown in Figure 14 (word or ideograph 300). During recognition process, the recognition target which is not divided in units of characters will be recognized (e.g., Radical 300, the first ideograph shown in Figure 15, which is a word meaning “wood” and is not divided in units of characters will be recognized.);

a generating unit referring to the list of at least one candidate word stored in said listing unit, and dynamically generating a feature amount of only a candidate word registered in the list using the feature amounts of characters stored in said dictionary unit during a recognition process for the recognition target (Figure 16; Column 21, Lines 3-28);

a collating unit collating the generated feature amount of the word with the feature amount extracted from the recognition target and outputting a recognition result (Figures 11-13; Column 20, Lines 63-67, Column 21, Lines 1-28. The feature amounts of a recognition target (e.g., Radical 300 meaning “wood”) will be precisely compared with the feature amount of bound models 104 by bound evaluation unit 26.).

Regarding Claim 5, Lyon further discloses the word recognizing apparatus according to Claim 1, wherein said generating unit generates the feature amount of the word by using feature amounts of a plurality of characters (Figures 2, 5A-B, 6 and 7. Feature amounts of the word “feed” is generated by using feature amounts of plurality of characters “f”, “e” and “d”).

Regarding Claim 7, Lyon further discloses the word recognizing apparatus according to Claim 1, wherein said collating unit performs a non-linear matching of the feature amount of the

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word and the feature amount of the recognition target, and calculates a degree of similarity between the feature amount of the word and feature amount of the recognition target (Figures 8-10; Column 16, Lines 45-67, Column 17, Lines 1-19. The bounds evaluation unit 26 performs the comparison operation by generating a set of error values E1-E8 that indicates the difference between the recognition target “fog” and character bound models.).

Regarding Claim 8, Lyon further discloses the word recognizing apparatus according to Claim 1, wherein said listing unit stores a list which has a high possibility of containing a word corresponding to the recognition target (Column 4, Lines 46-61).

With regards to Claims 9-14, arguments analogous to those presented for Claim 1 are applicable to Claims 9-14.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon (U.S. 5,675,665).

Regarding Claim 2, Lyon discloses the word recognizing apparatus according to Claim 1, wherein said collating means includes a memory means which stores the feature amounts of the word (Figure 1, bounds measurement memory 36, bounds model memory 38). Lyon et al does

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not explicitly disclose releasing the memory means when a collation of the feature amount of the word is completed, and storing a feature amount of the next word. Utilizing a region of memory (buffer) for using as an intermediate repository in which data is temporarily held while a specific instruction is being executed is well known in the art (Official Notice). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention to incorporate releasing the memory location when a collation of the feature amount of the word is completed, and storing a feature amount of the next word in that location because it is a well known procedure routinely implemented in the art.

8. Claims 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lyon (U.S. 5,675,665) in view of Tsuruoka et al (Handwritten "KANJI" and "HIRAGANA" Character Recognition Using Weighted Direction Index Histogram Method).

Regarding Claim 3, Lyon further discloses the word recognizing apparatus according to Claim 1, further comprising:

an inputting unit for inputting an image as the recognition target (Figure 1, input device 14). The feature extraction disclosed by Lyon is different from the feature extraction recited in further limitations of Claim 3. Tsuruoka et al disclose a handwritten character recognition system comprising extracting means for performing a one-dimensional gradating conversion in a direction perpendicular to a connecting direction of characters for a direction code histogram of a contour line in each of the plurality of small areas in an inputted image provided that no gradating conversion is performed in the connecting direction of the characters, and extracting a direction code histogram series obtained from a conversion result as the feature amount of the

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recognition target (Figures 2 and 3(a); Section 2.1, Weighted Direction Index Histogram Method; Section 2.2, 3-Dimensional interpretation. The gradation conversion is performed in a direction perpendicular to the connecting direction of the characters.). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teaching of Tsuruoka et al to extract a direction code histogram series obtained from a conversion result as the feature amount of the recognition target because it will increase the accuracy and improve the confidence level of the character recognition system.

Regarding Claim 4, Tsuruoka et al further disclose a segmentation algorithm for recognition of handwritten characters comprising extracting means for dividing a length of the inputted image in the direction perpendicular to the connecting direction of characters by a predetermined integer and divides the image into the small areas with an obtained quotient as a size of the small areas (Figure 2; Section 2.2, 3-Dimensional interpretation. The segmentation is performed in a direction perpendicular to the connecting direction of the characters.). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teaching of Tsuruoka et al to divide a length of the inputted image in the direction perpendicular to the connecting direction of characters by a predetermined integer and divide the image into the small areas with an obtained quotient as a size of the small areas because it will improve the accuracy of the character recognition system for narrow width characters.

Regarding Claim 6, Lyon does not disclose further limitations of Claim 6. Tsuruoka et al disclose a handwritten character recognition system comprising generating means generates a

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new direction code histogram series by arranging a plurality of directions code histograms series corresponding to the feature amounts of characters composing the word and designating a generated direction code histogram series as the feature amount of the word (Figures 2 and 3(a); Section 2.1, Weighted Direction Index Histogram Method). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Lyon invention according to the teaching of Tsuruoka et al to extract a direction code histogram series obtained from a conversion result as the feature amount of the recognition target because it will increase the accuracy and improve the confidence level of the character recognition system.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438.

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The examiner can normally be reached on Monday through Friday from 8:00 a.m. to 4:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au, can be reached at (703)308-6604.

Any response to this action should be mailed to:

Commissioner for Patents
Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for *formal* communications; please mark
"EXPEDITED PROCEDURE", for *informal* or *draft* communications, please
label "PROPOSED" or "DRAFT")

Hand delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center Customer Service Office whose telephone number is (703)306-0377.



Mehrdad Dastouri
Patent Examiner
Group Art Unit 2623
November 25, 2002